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a Danish Cohort Study

Rix, Thomas Andersen; Joensen, Albert Marni; Riahi, Sam; Lundbye-Christensen, Søren; Tjønneland, Anne; Schmidt, Erik Berg; Overvad, Kim

Publication date:
2013

Document Version
Accepted author manuscript, peer reviewed version

[Link to publication from Aalborg University](#)

Citation for published version (APA):

Rix, T. A., Joensen, A. M., Riahi, S., Lundbye-Christensen, S., Tjønneland, A., Schmidt, E. B., & Overvad, K. (2013). *U-Shaped Association Between Consumption of Marine n-3 Fatty Acids and Development of Atrial Fibrillation: a Danish Cohort Study*. Poster presented at Dansk Cardiologisk Selskabs årsmøde 2013, Nyborg, Denmark.

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U-Shaped Association Between Consumption of Marine n-3 Fatty Acids and Development of Atrial Fibrillation - a Danish Cohort Study

Thomas Andersen Rix¹, MD; Albert Marni Joensen¹, MD, PhD; Sam Riahi^{1,2}, MD, PhD; Søren Lundbye-Christensen¹, MSc, PhD; Anne Tjønneland³, MD, PhD, DMSc; Erik Berg Schmidt¹, MD, DMSc; Kim Overvad^{1,4}, MD, PhD

¹Department of Cardiology, Aalborg AF Study Group, Center for Cardiovascular Research, Aalborg University Hospital, Denmark

²Department of Health Science and Technology, Faculty of Medicine, Aalborg University

³Danish Cancer Society Research Center, Copenhagen, Denmark

⁴Section for Epidemiology, Department of Public Health, Aarhus University, Denmark

Objectives

The aim was to investigate the association between consumption of marine n-3 polyunsaturated fatty acids (PUFA) and development of atrial fibrillation (AF).

Background

Previous studies have suggested a lower risk of AF with higher intakes, but results have been inconsistent.

Methods

A total of 57,053 Danish participants 50 to 64 years of age were enrolled in the Diet, Cancer, and Health Cohort Study between 1993 and 1997. Dietary intake of fish and marine n-3 PUFA was assessed by a semi-quantitative food frequency questionnaire. Time-to-event data was analysed in a Cox proportional hazards regression model using restricted cubic splines.

Results

3,345 incident cases of AF occurred over 13.6 years (Figure 1). The association was U-shaped between consumption of marine n-3 PUFA and risk of incident AF, with the lowest risk of AF at moderate intake near the median consumption of 0.63 g/day (Figure 2). When comparing quintiles of marine n-3 PUFA intake, a 13% statistically signif-

icant lower risk of incident AF was seen in the middle quintile (HR 0.87, 95% CI 0.78-0.98) compared with the lowest quintile of intake (Table 1). Intake of total fish, fatty fish, and the individual n-3 PUFA, eicosapentaenoic acid, docosahexaenoic acid, and docosapentaenoic acid also showed U-shaped associations with incident AF.

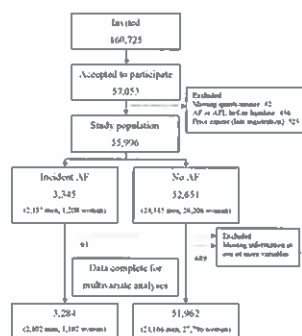


Figure 1. Flowchart of participants in the Diet, Cancer, and Health Cohort Study and incident diagnosis of atrial fibrillation (AF) recorded in the Danish National Patient Registry.

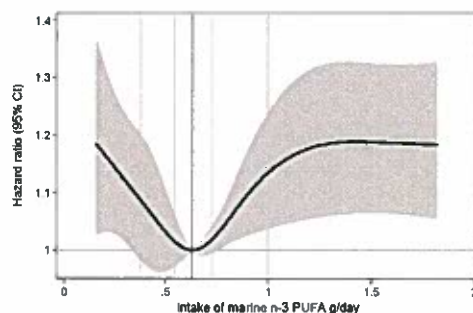


Figure 2. Dietary consumption of total marine n-3 polyunsaturated fatty acids (PUFA) and risk of incident atrial fibrillation. Median intake as reference (dark gray vertical line). The 20, 40, 60, and 80 percentiles of intake marked by vertical lines (light gray). Shaded gray area shows the 95% confidence interval for the hazard ratio for AF (black curve). By convention, only the 2.5 to 97.5 percentile of exposure is shown.

Table 1. Quintiles of Dietary Intake of Marine n-3 PUFA and Risk of Incident Atrial Fibrillation

| | | Crude | 95% CI | p | HR | 95% CI | p |
|----|-----------------|-------|-----------|------|------|-----------|------|
| Q1 | <0.39 g/day | 1 | | | 1 | | |
| Q2 | 0.39-0.53 g/day | 0.92 | 0.82-1.02 | 0.14 | 0.91 | 0.81-1.02 | 0.12 |
| Q3 | 0.54-0.73 g/day | 0.87 | 0.77-0.97 | 0.02 | 0.87 | 0.78-0.98 | 0.02 |
| Q4 | 0.74-0.99 g/day | 0.95 | 0.85-1.07 | 0.40 | 0.96 | 0.86-1.07 | 0.49 |
| Q5 | >0.99 g/day | 1.06 | 0.95-1.18 | 0.30 | 1.03 | 0.92-1.15 | 0.60 |

HR indicates hazard ratio; CI, confidence interval; p, p-value. Adjusted for age, sex, education, smoking, alcohol, years to school, hypercholesterolemia and/or cholesterol treatment, cancer (excluding skin cancer), diabetes mellitus, myocardial infarction (other-specified), and heart failure (other-specified).

Conclusions

We found a U-shaped association between consumption of marine n-3 PUFA and risk of incident AF, with the lowest risk close to the median intake of total marine n-3 PUFA.

A moderate dietary intake of marine n-3 PUFA may thus be preferable for primary prevention of AF.